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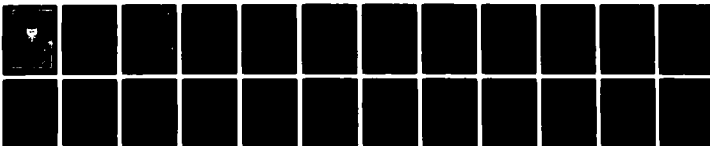
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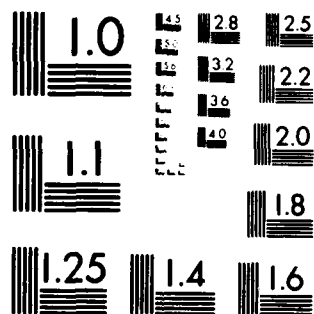
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CPT JOHN B. WOODS

GARMISCH, GERMANY

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SOVIET PERCEPTIONS OF NATO'S
ANTI-TANK DEFENSE

Captain John B. Woods

June 1981

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F O R E W O R D

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SUMMARY

In this paper, the author uses basically Soviet sources to examine Soviet military thought regarding NATO's anti-tank defensive capability. He approaches this task from the viewpoint of the Soviet military reader. For the purpose of this paper only two general areas are addressed: 1.) ground defensive capabilities and 2.) ATGM-armed helicopters. One must remember throughout this paper that the point of view is that of a Soviet, and how he perceives NATO's anti-tank defense. It is the author's conclusion that the Soviets are, in fact, very much concerned with that defense and the possible damage it could do to a Soviet offensive. However, while they do fear it -- NATO's anti-tank defense -- the basic characteristic of the Soviet offensive doctrine continues to be the use of tank-heavy forces in the European area.

I

The lessons of the Arab-Israeli War of 1973 concerning tank employment were not lost to the Soviets.¹ They recognize the potential of anti-tank guided missiles (ATGMs), particularly if tanks attempt to operate without proper support, as did the Israeli tank units in the early stages of that war.

The Soviet military leaders offer no argument against the effectiveness of the ATGMs. This effectiveness (in the Soviet view) creates problems for their offensive operations.² If this is so, then the main problem for the Soviets becomes one of how to defeat or counter NATO's antitank (AT) capabilities in order to insure the tank's primacy in offensive operations and the high rates of advance dictated by Soviet offensive doctrine.

The Soviet articles consider two basic directions regarding the NATO anti-tank defense. They are: 1) the ground elements of the AT defense, and 2) the role of helicopters on the contemporary defensive battlefield.

The Soviet concept of the offensive calls for the tank to provide the punch. Only through the offensive can the ultimate goal be obtained -- total destruction of the enemy's forces. If NATO's anti-tank defense can hold against the initial offensive surge of massed Soviet armor, then Soviet plans may be thrown askew. But can NATO's AT defense hold (in the Soviet view)? What do the Soviets think about NATO's defensive

capabilities? This last question is one which hopefully will be clarified by this paper. We shall begin by first examining what the Soviets have written concerning the ground element of NATO's anti-tank defense.

II.

"The Americans consider the anti-tank defense the 'backbone' of all defenses."³ The U.S., therefore, first organizes its anti-tank defense by concentrating on emplacing its AT weapons in depth covering the most important tank approaches. This defense consists of two echelons according to Colonel Filimonov, writing in Voyennyy Vestnik. He sees the primary goal for the defensive platoons as one of separating the infantry from the tanks, thereby allowing the anti-tank defense to destroy the tanks piecemeal.⁴

Furthermore, the Soviets fully expect to encounter tanks within NATO's anti-tank defense.⁵ These tanks will be held in the reserve either for counterattacking any breakthrough of Soviet forces or for repulsing the enemy if they (Soviets) manage to penetrate to the reserve positions. However, the Soviets also believe that NATO tank units may be attached to combat units to battalion, company and even platoon level in the defense. These tanks will be placed into prepared positions within the unit strong points at a distance of 150-200 meters from one another. This will permit them to support one another as well as the other types of weapons found within the defensive position. Each tank will prepare two to three firing positions to which they can shift if one position becomes too vulnerable. Hence, in the Soviet opinion, the NATO anti-tank defense is seen as one based on creating a system of echeloned and maneuverable anti-tank fire. It is characterized by continuous zones of tank-defeating

weapons not only along or in front of the forward edge of the defensive area, but also in depth with the highest possible complement of anti-tank weapons and a developed system of mines and obstacles.⁶ Do the Soviets feel that NATO is preparing or capable of preparing just such a defense?

"NATO considers combat with tanks the most important task in a combined arms battle."⁷ In this light, Colonel Nikitin, writing in Znamenosets, declares that "the most powerful and reliable means of victory is considered to be nuclear weapons."⁸ However, he goes further to explain that these types of weapons may not always be used. Therefore, other means of defeating the tank will take on an important significance. These include: 1) aircraft, 2) helicopters, 3) tanks, 4) ATGMs, 5) artillery, 6) anti-tank mines and other means. Main attention has, therefore, been placed upon the fast and accurate fire at tanks from a distance, hence the creation and continued development of the ATGM. In order for NATO planners to increase the chances for success of its anti-tank defense in depth, the ATGMs must be available in sufficient quantities to mount on vehicles to ensure mobility.⁹

The Soviets believe that having a quantity of these anti-tank weapons will permit the infantryman to successfully combat tanks. "Among the various antitank weapons the main role is played by the ATGM."¹⁰ Furthermore, the infantryman having this type of weapon receives a significant capability to destroy armored targets of all types. On the contemporary battlefield the infantry can successfully engage tanks, thereby freeing the tank for its primary mission.¹¹

ATGMs give the infantryman that which was previously lacking, i.e., a weapon with a high percentage of destroying tanks with one shot at a

distance from which the main gun of the tank cannot be used against the infantry. Hence, the Soviets fully expect NATO's anti-tank defense to be "saturated" with all types of anti-tank weapons which permit the weakness of one type of weapon to be compensated for by another type of anti-tank weapon.¹²

Several Soviet authors expressed deep concern about the third generation of Western ATGMs.¹³ In particular, the two trends which bother the Soviets are: 1) the increased speed and range of the third generation missiles, and 2) their "vystrelil i zabyl" (fire and forget) capability. Add to this the enhanced capability of third generation ATGMs to be utilized efficiently at night and during periods of poor visibility. At the same time, the NATO countries are continually improving the delivery vehicles of ATGMs. The continued Western technical advantage in ATGMs bothers the Soviet military leaders. Those leaders agree with Western experts that the ATGMs are most effective at long ranges.¹⁴

The following strengths of the ATGM are acknowledged by the Soviets.¹⁵ First, as was mentioned above, the ATGM possesses great range, with the next generation promising even better ranges. Secondly, they are highly mobile whether mounted on an armored personnel carrier (APC), an infantry fighting vehicle (IFV), a jeep, or in a man-packed configuration. Thirdly, their accuracy is excellent and their ability to penetrate the heaviest armor presently found on the battlefield is excellent. Additionally, employment on advantageous terrain permits the ATGM to be utilized at its maximum range.

Soviet military authors found the following weaknesses with the ATGM. The most discussed was the slow speed of flight from launch to target.¹⁶ Secondly, the ATGMs have a pronounced signature upon launch, thereby

giving an alert enemy tank crew time to maneuver and open fire. A third weakness of the current generation of ATGMs is their limitation due to poor visibility (during periods of darkness, fog, rain, snow, etc.). As mentioned above the third generation of Western ATGMs are being designed to eliminate this problem. Fourthly, the operator is vulnerable if the launch is from a man-packed configuration or from a light-skinned vehicle. Additionally, the operator of a current generation ATGM must maintain continuous observation of the missile in flight from launch to impact. These factors give the tank crew time to react and fire a round at the launch point. Lastly, ATGMs of Western design are limited from close-in use by the distance in flight required before the missile will arm.¹⁷ How do the Soviets anticipate taking advantage of these weaknesses?

Numerous articles have been devoted to this very important question.¹⁸ This gives a strong indication that the Soviets are concerned with NATO's anti-tank defensive capability.

Continuous reconnaissance is stressed for Soviet tank crews.

It is well-known that in the course of the confrontation of tanks with ATGMs it is very important to determine their direction and sectors of fire, without that it is impossible to be successful in battle.¹⁹

This permits the tank, upon detecting the missile, to "run" for cover utilizing the terrain to break the observation of the ATGM operator. Furthermore, the tankers are warned by Colonel Kuvitanov, also writing in Znamenosets, to ensure that they do not give the ATGM a flanking shot at any time throughout their evasive maneuver.

In order to be successful in battle against ATGMs, the tanker is advised to learn the technical characteristics of the NATO ATGM as well as their tactical employment. This will help the crew to quickly locate

the ATGM and to open fire with some degree of accuracy. These, according to Colonel Kuvitanov, are the "most important conditions for success."²⁰

Colonel Bondarenko places the responsibility upon the tank crews for knowing in detail the anti-tank weapons of the capitalist countries, their tactical employment and technological characteristics, and also the role and place of them in the combat formations of the basic branches.²¹ Additionally, he presents the tanker with a list of methods whose use will lower the effectiveness of the enemy's anti-tank weapons: 1) constantly maneuver with the goal of evading destruction, 2) fire and maneuver by the tanks, and 3) use smoke for blinding the enemy and camouflaging the tank unit's own combat formation. In order to ensure that the tank units understand these tasks, he recommends constant training through the use of field training exercises. Ultimately, the advice for the tanker in the ATGM's killing zone is to quickly close with the enemy by fire and maneuver and destroy him. During fire and maneuver, the tanks conduct fire on the move to suppress the effectiveness of the ATGM. To ensure success, "one must first look to the tank subunits (podrazdeleniya) to completely grasp all of the subject which may significantly lower the effectiveness of the fire of these weapons."²²

In his article, Colonel Kuvitanov stressed that the driver-mechanic must be taught anti-ATGM maneuvers. Furthermore, the driver must initiate these maneuvers either upon command or upon his own initiative.²³ These maneuvers include taking cover behind the crests of hills, frequently turning left or right, taking into account the flight time of the missile, and utilizing all types of obstacles (tress, bushes, etc.). His suggested scenario is that of a tank company in the attack with artillery support following a nuclear strike. The tanks locate the ATGMs and quickly fire

upon them. These tanks are supported by infantry who will fire with all their weapons in the direction of the ATGMs and other anti-tank weapons.

Praporshchik Vavilov, a tank platoon leader, directs the thrust of his article toward the training of tank crewmen, specifically toward convincing the individual tankerman that in combat against ATGMs he, the tankerman, has the advantage. He also stresses the use of terrain features in order to move forward without continuously presenting a target. The commander, according to Vavilov, must use every possible means for educating his soldiers and sergeants "to trust and have faith in the strength and might of our tanks."²⁴ The most important quality of the tankerman is skill, according to the platoon leader.

Soviet articles stress the importance of crew training. In order to successfully fight ATGMs, the tank crew must be psychologically prepared to eliminate any fear upon first encountering enemy anti-tank weapons.²⁵ Soviet belief is that a well-trained and coordinated crew can successfully conduct combat against anti-tank defenses. This also requires close cooperation with infantry, artillery, helicopters and aviation assets. All crew training must be serious and intensive.

Nuclear fires may be used to suppress an anti-tank defense, but if they are not, a significant role is then played by artillery. The use of Soviet artillery calls for both direct and indirect fire support.²⁶ Through the use of barrage fires the Soviets hope to keep the heads of the defenders down. The artillery will also provide a smoke screen to shield the attacking forces from the defenders' view. Simultaneously, the artillery will direct its fires to suppress the anti-tank reserve. In the Soviet view, the anti-tank reserve will most likely consist of

tanks to be used to counterattack any offensive success which the attackers achieve.

General-Lieutenant of Artillery Koritchuk, writing in Voyennyy Vestnik, calls for the suppression of five targets per kilometer of front at a distance of 2 to 3 kilometers from the forward edge of the defense. At a distance of 2 to .5 kilometers, he suggests a density of 10 to 12 targets per kilometer of front. In the last half kilometer the density must grow to 15 to 16 targets per kilometer of front.²⁷ This will necessitate a large amount of fire support coordination between attackers and supporters. The importance of artillery to the commander for suppressing anti-tank defenses is second only to nuclear fires.²⁸

Another vital mission for the supporting artillery will be to clear anti-tank minefields which the Soviets expect NATO to depend heavily upon.²⁹ A US engineer platoon will be attached, according to the Soviet view, down to maneuver battalion level.³⁰ The primary mission of these engineers is to reinforce the anti-tank defense by fire, and secondly, to lay minefields and build obstacles. According to Soviet expectations, a US engineer platoon can lay a minefield of 5,000 anti-tank mines in an area of over three kilometers (i.e., a density of 1,100 AT mines per 1 km of front).³¹ This minefield could present, in the view of the Soviets, a serious problem to their attacking tanks unless their artillery can successfully blow a gap through it for them.

Furthermore, Soviet artillery must also continuously suppress the enemy artillery. It also should be targeted at communication points, radar units and reconnaissance units.³² As mentioned earlier, fire support coordination is extremely important. To solve this problem, Colonel Rodin, writing in Voyennyy Vestnik, recommends that artillery

observers with their own communications be attached to the attacking companies.³³

Any target not destroyed by fire support weapons must be engaged by the attacking Soviet tanks.³⁴ For area targets located beyond 2,500 meters from the attackers, an entire tank company can be expected to open with barrage fire. Any group target less than 2,500 meters will be taken under fire by a platoon.

Entire attacking platoons can also be expected to open fire on single targets (i.e., ATGM, tank, anti-tank gun, etc.). By these means the Soviets expect to overcome the anti-tank defense established by NATO forces.

In Part II we have highlighted Soviet military writings dealing with the ground elements of NATO's anti-tank defense. To review briefly, Soviet military leaders expect to meet a well-coordinated, mutually-supporting anti-tank defense of various types of weapons. This defense will be organized in depth. The various weapons which NATO defenders have at their disposal include:

- nuclear weapons
- artillery
- aviation
- ATGMs
- other AT weapons
- AT minefields/obstacles

The Soviets also expect NATO defenders to utilize three basic methods for combating Soviet numerical superiority in tanks:

- mass destruction of tanks by nuclear fires, artillery, and air attacks

- destruction of single tanks by direct fire means (ATGMs primarily)
- reduction of the rate of advance and infliction of casualties by means of obstacles (minefields primarily)

In response, Soviet emphasis is placed upon crew training as a means of providing to the tanker an advantage over the NATO defender. Thus far we have neglected to look at a very important element of the NATO anti-tank defense. That is, of course, the role played by the ATGM-armed combat helicopter.

III

Notwithstanding the horrible experience of Israeli tank forces in the 1973 war, the Soviets continue to believe in the tank as their primary offensive weapon. They especially see an important use for tanks in the Central European area of operations.³⁵

At the same time, the Soviets fear the major role to be played by ATGM-armed helicopters in NATO's AT defense. "A special role in the system of anti-tank defense is played by combat helicopters."³⁶ General-Major Onusaytis, writing in Voyennyy Vestnik, states that the West places great emphasis in the development and armament of NATO forces with anti-tank means. "Helicopters, armed with ATGM's, receive wide dissemination in their forces."³⁷

According to Colonel Nikitin, the tendency for all NATO members is to put ATGMs on fire support helicopters. "In training and maneuvers the forces of NATO widely conduct experiments on the effectiveness of helicopter operations in combat with tanks."³⁸ He cited as an example one particular field training exercise of NATO forces which pitted ATGM-armed helicopters against tanks and Vulcan air defense weapons. Colonel Nikitin set the final score as 14 helicopters "shot down", but 167 tanks and 29

Vulcans "destroyed."³⁹ That works out to 11.9 tanks for each helicopter. From the tone of his article there is very little doubt that he is definitely impressed by the capabilities of the combat helicopter and NATO's use of them to drastically improve its anti-tank capability.

The current authority on combat helicopters appears to be Colonel M. Belov. Numerous articles by him have appeared in Soviet military publications. He notes that the reason for NATO's continued development of new generations of ATGMs and newer models of helicopters is the concern regarding possible combat with Warsaw Pact tanks.⁴⁰ Special trust is placed in helicopters by the NATO leaders due to the following advantages over ground combat vehicles:⁴¹

- speed of movement
- high maneuverability
- direct fire capability at great distances (2-3+ km) independent of terrain features
- ability to launch surprise strikes from the most advantageous direction, again independent of terrain features.

These advantages were echoed by Colonel of Engineers I. Chebotarev.

He states:

The advantages of the helicopter are seen in the fact that they can conduct combat operations in badly broken terrain at a wide range of speed of flight, maneuvering nicely. Besides that, the anti-tank weapon from a helicopter can be utilized from the maximum distance...⁴²

Furthermore, he stated that the combat helicopter was better than airplanes since the helicopter could get down under the clouds to operate against tanks when the ceiling for aircraft was too low. The combat experience in the use of helicopters in Vietnam showed their high armor kill probability.⁴³

A special role will be played by the combat helicopter in the anti-tank reserve, according to Colonel Chebotarev.⁴⁴ This role is defined by the helicopter's ability to "pop up" and engage the target at the maximum range and then drop down behind cover hopefully before the tank and air defense forces can successfully engage it. At the present time, ATGMs are limited by the need for the operator to guide them to the target, however, with the development of the "Hellfire" ATGM, which will be laser-guided, this limitation will no longer exist. Hence, the battlefield role of NATO's combat helicopters will be significantly increased.⁴⁵

As mentioned above the Soviets continue to depend upon the offensive capability of their tank forces in the Central European area. At the same time, the Soviets expect to meet with NATO's helicopters in force there.⁴⁶ Colonel Belov expects that the helicopters will "hug" the earth using terrain features before gaining altitude to combat the tanks. Furthermore, the NATO forces are seen through Soviet eyes as concentrating heavily on working out detailed utilization of helicopters in cooperation with the ground forces.⁴⁷

In Part II, we saw how important the Soviets view NATO use of anti-tank minefields. To this end, the Soviets feel that another major use of the helicopter in the anti-tank defense will be as a minefield delivery system. This utilization of the helicopter would certainly enhance NATO's anti-tank capability.⁴⁸

Airmobile units utilized in the anti-tank defense also concern the Soviets.

The NATO Command considers that airmobile units give an anti-tank defense such maneuverability, which before was not possible, and presents⁴⁹ the decisive means for destroying large groups of enemy armor.

Belov sites the belief of the Bundeswehr Command that within ten years the helicopter will become the main means of combating Warsaw Pact tanks.⁵⁰ In this light, the Bundeswehr, according to Belov, is developing a special combat helicopter. Apparently, there is concern within the Ministry of Defense over the possible deployment of such a helicopter within NATO forces.⁵¹ Of particular concern is the possible formation of anti-tank helicopter brigades at NATO Corps and/or field army. One possible configuration of that Brigade is:

- brigade headquarters
- two regiments of combat helicopters (87 per regiment)
- scout squadron (10 helicopters)
- air mining battalion (16 helicopters)
- necessary commo, maintenance and supply units⁵²

Colonel Belov claims that if only 50 percent of this brigade were to fly a combat sortie, they could possibly destroy a total of 324 tanks.⁵³ By way of comparison, that is almost the number of main battle tanks found in an entire Soviet tank division (325 according to U.S. Army FM 30-102, titled Opposing Forces). Anti-tank helicopter brigades roaming the battlefield with this capability could decimate and disorganize Soviet offensives.

Moreover, helicopters working forward of the defense could help to disorganize and severely weaken an offensive prior to its reaching the anti-tank defensive positions. The helicopters can be effectively utilized to ambush tanks spotted by various means of reconnaissance.⁵⁴ In the event that the defensive units are forced to withdraw to new positions, the combat helicopter can successfully provide effective covering fire to permit the main force time to establish its new defensive line.

A serious disadvantage with the present generation of NATO combat helicopters is vulnerability to ground fire. Since the speed of the helicopter is relatively slow when compared to airplanes, they remain in the air defense zone for a longer amount of time.⁵⁵ Additionally, upon launch of a present generation ATGM, the operator is required to maintain visual contact with the target until impact. This fact also forces the helicopters to remain in the air defense zone for a long period. However, the Soviet authors pointed out that via nap-of-the-earth flying techniques it was difficult for the air defense forces to locate the enemy helicopters in sufficient time to take them under effective fire.⁵⁶ Also, as was discussed in Part II, the Soviets are concerned with NATO's third generation ATGMs (such as the U.S. "Hellfire") which will be a "fire and forget" missile.

"In conditions of the wide use of combat helicopters, the struggle with them becomes the most important mission of all commanders, in the first instance, the commanders of the tank and motorized rifle battalions."⁵⁷ The same advice for success in combating ATGMs is given the tankers for combating NATO's combat helicopters: "In order to organize and successfully conduct such a battle, it is necessary to know well the combat formations and tactics of these helicopters."⁵⁸

Colonel Konoplya tells the tanker that the priority of targets for NATO helicopters is:

- tanks
- air defense weapons
- command vehicles
- infantry fighting vehicles
- other type targets

This provides an incentive for the tankers to learn well those steps to take when engaging helicopters. Helicopters should be engaged by concentrating the fire of several tanks or the entire platoon or company at individual helicopters.⁵⁹ Furthermore, concentrated small arms fire can also successfully defeat helicopters.

The intelligent use of smoke is encouraged. Additionally, it is recommended that Soviet tank units make maximum use of night and other periods of poor visibility (i.e., fog, snow, rain, etc.) to conduct movements.⁶⁰

Prior to conducting an offensive the battalion commanders must emphasize the artillery support missions: to destroy enemy helicopters while still on the ground. Secondly, the commander must correctly determine the location and mission of air defense in the movement of the battalion, in its reconnaissance missions, and in the conduct of the attack. Thirdly, the battalion commander must determine the method of conducting fire at any attacking helicopters by the tanks and motorized rifle subunits. Finally, the commander must ensure the coordination between the various types of units in the interest of combating the enemy air.⁶¹

From these articles one obtains the opinion that the Soviets are deeply concerned with the threat that the ATGM-armed helicopter poses to a possible Soviet offensive. The Soviets have evaluated the use of helicopters by U.S. forces in Vietnam and found their use to be effective; hence, the development of a Soviet helicopter, which unlike its Western counterpart, is heavily armored. As that old saying goes, "Imitation is the most sincere form of flattery."

IV

It is this author's opinion that the Soviets do perceive NATO's anti-tank defense as an adequate one. While the Soviets admit this fact, they are not easily panicked. The basic premise of their doctrine remains one of the offensive utilizing massive armored formations in close coordination with infantry, artillery and aviation. They will continue to seek to improve their own forces as a means of responding to any perceived improvement in NATO's capability to halt or significantly slow the desired rate of advance. One should expect to see more calls for realistic training of tank crews as well as more articles pertaining to the responsibilities of small unit commanders and individual tank commanders in order to successfully combat NATO's ATGMs and penetrate NATO's AT defense.

FOOTNOTES

Part I

¹A. Rodin, "Bor'ba Artillerii s Protivotankovymi Sredstvami," Voyennyy Vestnik, No. 5/1974, p. 70.

²Phillip A. Karber, "The Soviet Anti-tank Debate," Survival, May/June 1976, p. 109.

Part II

³A. Filimonov, "Mekhanizirovannaya Diviziya Armii SShA v Boyu," Voyennyy Vestnik, No. 4/1972, p. 117.

⁴Filimonov, p. 120, and A. Rogozhkin, "Protivotankovye Sredstva v Armiyakh Stran NATO," Voyennyy Vestnik, No. 9/1972, p. 122.

⁵Filimonov, p. 118, and A. Ryzhkov, "Motopekhhotnyy Batal'on Bundesvera," Voyennyy Vestnik, No. 7/1974, p. 116.

⁶Rodin, p. 70, and Ryzhkov, p. 116.

⁷N. Nikitin, "Novoye v Bor'be s Tankami," Znamenosets, No. 5/1974, p. 38. (emphasis added).

⁸Nikitin, p. 38.

⁹G. Biryukov and G. Melnikov, Antitank Warfare, Moscow: Progress Publishers, 1972, p. 99,

Success in combat, therefore, depends not only on the total number of antitank weapons, but also on the ability to commit simultaneously to action the right number of these weapons against a definite number of enemy tanks.

and Biryukov and Melnikov, p. 122, concerning the density of anti-tank weapons found in the Bundeswehr defensive zones.

¹⁰O. K. Dmitriev, "Protivotankovaya Oborona Armii SShA," Voyennyy Vestnik, No. 10/1980, p. 92.

¹¹According to Soviet doctrine, the primary mission of the tank is to breakthrough the enemy defense and to develop success in depth. Unfortunately, this idea as postulated by General-Major Dmitriev is erroneous in Western doctrine toward Europe since neither the U.S. Army in Europe nor NATO have any offensive plans toward the East. However, it will permit the NATO forces to concentrate tanks to gain an offensive advantage within a specific local area.

¹²L. I. Korzun and A. V. Tonkikh, Oruzhiye Protiv Tanka, Moskva: Izdatel'stvo DOSAAF, 1970, p. 57, and Dmitriev, pp. 93-94, for example:

U. S. Infantry Division: 162 ATGM launchers (TOW)
243 ATGM launchers (Dragon)
U. S. Mechanized Infantry Division: 108 ATGM launchers (TOW)
162 ATGM launchers (Dragon)
U. S. Armored Division: 90 ATGM launchers (TOW)
135 ATGM launchers (Dragon)

and General-Lieutenant of Artillery V. Koritchuk, "Bor'ba a Protivotankovymi Sredstvami v Nastuplenii," Voyennyy Vestnik, No. 6/1975, p. 67.

¹³Dmitriev, p. 93. He claims that the Hellfire will have supersonic speed and a maximum effective range of 8,000 meters with a fire and forget capability.

¹⁴Ryzhkov, p. 116, ATGMs will hit out to 3,000 meters, and William Baxter, "Soviet Doctrine Responds to Antitank Missile Threat," Army, Vol. 30, No. 8, August 1980, p. 30, and Karber, p. 109.

¹⁵Y. Volodin, "Antitank Means in Defense," Soviet Military Review, No. 5, May 1975, p. 18, and Ryzhkov, p. 116.

¹⁶G. Kuvitanov, "Pod Pritselami PTURSOv," Znamenosets, No. 5/1979, pp. 2-3, this article in general deals with the actions a tank crew should follow when taken under fire by an ATGM, also see the article by Warrant Officer P. Vavilov, "Tank Protiv PTURS," Znamenosets, No. 6/1980, P. 9, also gives methods for defeating the ATGM, as well as V. Bondarenko, "V Pritselakh Tankov -- PYURS," Voyennyy Vestnik, No. 3/1980, pp. 28-31.

¹⁷Dmitriev, see the chart on p. 93 or the chart found in D. Korbin, "PTURS Zarubezhnykh Armiy," Voyennyy Vestnik, No. 2/1979, p. 89, or Rogozhkin, chart, p. 120.

¹⁸See the following articles: Bondarenko, pp. 28-31, Vavilov, p. 9, D. Shapovalov, "Obucheniye Ekipazhey Bor'be s Tankami, CAU i PTURS," Voyennyy Vestnik, No. 6/1975, pp. 64-66, Nikitin, p. 39, and G. Shevchuk, "Chtoby Uspeshno Borot'sya s Tankami," Voyennyy Vestnik, No. 7/1978, pp. 45-46.

¹⁹Kuvitanov, p. 2.

²⁰Ibid.

²¹Bondarenko, p. 28.

²²Ibid., p. 31.

²³Kuvitanov, p. 3.

²⁴Vavilov, p. 9.

²⁵Shevchuk, p. 45.

²⁶Koritchuk, p. 68.

²⁷Ibid., p. 69.

²⁸Rodin, p. 71.

²⁹Ibid., p. 70, and p. 73.

³⁰Rogozhkin, p. 123.

³¹Biryukov and Melnikov, p. 131, and Rogozhkin, p. 123.

³²Rodin, p. 72.

³³Ibid., p. 74.

³⁴V. Ryabchikov, "Overcoming Antitank Defences," Soviet Military Review, No. 5, May 1971, pp. 15-16.

Part III

³⁵Yu. Onusaytis, "Vooruzhennyye Sily NATO Na Tsentral'no-Evropeyskom TVD," Voyennyy Vestnik, No. 6/1975, p. 118. While the quote says that "NATO specialists" see very wide utilization of tanks in this region, he does not disagree, which I translate to mean (in accordance with the tone of the article) that the Soviets very much plan to use tank heavy forces in any offensive thrust against NATO.

³⁶Dmitriev, p. 95.

³⁷Onusaytis, p. 119.

³⁸Nikitin, p. 38.

³⁹M. Belov, "Vertolety v Bor'be s Tankami," Voyennyy Vestnik, No. 2/1974, p. 125, and Nikitin, p. 38.

⁴⁰Belov, p. 124.

⁴¹Ibid., p. 124, and M. Belov, "Boy i Vertolety," Voyennyye Znaniya, No. 12/1974, p. 41.

⁴²I. Chebo arev, "Vertolet Protiv Tank," Aviatsiya i Kosmonavtika, No. 10/1977, p. 46.

⁴³Ibid., p. 46.

⁴⁴Ibid.

⁴⁵Ibid., p. 47.

⁴⁶Belov, "Vertolety v Bor'be s Tankami," p. 124.

- ⁴⁷Ibid.
- ⁴⁸Belov, "Boy i Vertolety," p. 41.
- ⁴⁹Belov, "Aeromobil'nye Protivotankovye Formirovaniya," Voyennyy Vestnik, No. 1/1978, p. 121.
- ⁵⁰Belov, "Vertolety v Bor'be s Tankami," p. 125.
- ⁵¹Belov, "Aeromobil'nye Protivotankovye Formirovaniya," p. 120.
- ⁵²Belov, "Vertolety v Bor'be s Tankami," p. 125, and A. Bulatov, "Aeromobil'nye Protivotankovye Sredstva," Voyennyy Vestnik, No. 9/1975, p. 118. The two authors differ slightly in their estimation of the total number of helicopters which could be assigned to this type of unit.
- ⁵³Belov, "Aeromobil'nye Protivotankovye Formirovaniya," p. 120.
- ⁵⁴Bulatov, p. 118.
- ⁵⁵Chebomarev, p. 46.
- ⁵⁶Ibid.
- ⁵⁷P. Konoplya, "Bor'ba s Protivotankovymi Vertoletami v Nastuplenii," Voyennyy Vestnik, No. 9/1979, p. 18.
- ⁵⁸Konoplya, p. 18.
- ⁵⁹Ibid., p. 19.
- ⁶⁰Ibid., p. 20.
- ⁶¹Ibid.

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